

## **I. EXECUTIVE SUMMARY**

This report contains the findings of a traffic and parking impact study conducted for the Fairfax County Department of Housing and Community Development. Fairfax County Department of Housing and Community Development is proposing to revise the currently approved development plan of the existing Lewinsville Center located along the east side of Great Falls Street between the signalized intersections of Chain Bridge Road to the north and Magarity Road/Davis Court to the south. Currently, the Center has a mix of community uses including two child day care centers, an adult day care center, a senior recreation center, and an adult independent living area. Fairfax County Department of Housing and Community Development is planning to add sixty (60) assisted living areas and an Alzheimer Family Care Center.

The analysis presented in this report supports the following major conclusions:

### **Existing Conditions Exclusive of any New Site Development (2002)**

The following signalized intersections will require improvements to meet the criteria of a level of service "D" or better under the existing condition.

1. Great Falls Street with Chain Bridge Road
2. Great Falls Street with Magarity Road/Davis Court

The intersection of Great Falls Street with Chain Bridge Road will need adjustments to the signal timing, phasing, and Cycle as well as re-striping the northbound portion of the intersection to include an additional northbound through lane. The existing roadway cross section is wide enough to accommodate this modification to achieve a level of service "D" or better (*Level of Service definitions are depicted on pages 13 and 14 of the text*). In addition, the intersection of Great Falls Street with Magarity Road/Davis Court will need adjustments to the signal timings to achieve a level of service "D" or better. All suggested roadway improvements are required to accommodate existing traffic conditions exclusive of any new development at the Lewinsville Center.

### **Future Conditions with Proposed New Development (Total Future) 2006**

The following signalized intersections will require improvements to meet the criteria of a level of service "D" or better under the existing condition and continue to need improvements under the total future conditions.

1. Great Falls Street with Chain Bridge Road
2. Great Falls Street with Magarity Road/Davis Court

As stated under the existing conditions and exclusive of the Lewinsville Center, the intersection of Great Falls Street with Chain Bridge Road will need adjustments to the signal timing, phasing, and Cycle length as well as re-striping the northbound portion of the intersection to include an additional northbound through lane. The existing roadway cross section is wide enough to accommodate this modification to achieve a level of service "D" or better (*Level of Service definitions are depicted on pages 13 and 14 of the text*). In addition, the intersection of Great Falls Street with

Magarity Road/Davis Court will need adjustments to the signal timings to achieve a level of service "D" or better. All the suggested roadway improvements are required to accommodate existing traffic conditions exclusive of any new development at the Lewinsville Center. It is also recommended that a southbound left turn bay and northbound right turn bay be incorporated into the overall design of the Lewinsville Center in order to maintain uninterrupted traffic flow along Great Falls Street.

## II. INTRODUCTION

This report contains the findings of a traffic and parking impact study conducted for the Fairfax County Department of Housing and Community Development. Fairfax County Department of Housing and Community Development is proposing to revise the currently approved development plan of the existing Lewinsville Center located along the east side of Great Falls Street between the signalized intersections of Chain Bridge Road to the north and Magarity Road/Davis Court to the south. Currently, the Center has a mix of community uses including two child day care centers, an adult day care center, a senior recreation center, and an adult independent living area. Fairfax County Department of Housing and Community Development is planning to add sixty (60) assisted living areas and an Alzheimer Family Care Center. A regional map showing the location of the site is included in Figure 1.

The following tasks were completed as part of this study:

- Gorove/Slade Associates completed a scoping meeting with the design team on July 24, 2002 with a representative from the Fairfax County Department of Housing and Community Development to determine the study scope;
- Gorove/Slade Associates conducted field reconnaissance in the vicinity of the project sites to collect information related to existing traffic controls, roadway geometry and operational characteristics;
- Gorove/Slade Associates conducted traffic counts during the weekday mornings and evenings, and Saturday midday peak periods at the following intersections on Tuesday, July 16, 2002 and Saturday, July 20, 2002:
  1. Chain Bridge Road with Great Falls Street (AM, PM, Sat)
  2. Magarity Road/Davis Court with Great Falls Street (AM, PM, Sat)
  3. Lewinsville Center North Site Driveway with Great Falls Street (AM, PM, Sat)
  4. Lewinsville Center South Site Driveway with Great Falls Street (AM, PM, Sat)
- Gorove/Slade Associates conducted Average Daily Traffic counts along Great Falls Street with Automated Traffic Recorders from July 14, 2002 to July 20, 2002;
- Gorove/Slade Associates conducted a parking survey at the Lewinsville Center on September 18, 2002 from 11:00 am to 2:00 pm;
- Gorove/Slade Associates conducted a pick-up and drop-off survey at the entrance to the Day Care Centers on Wednesday, September 18, 2002;
- Gorove/Slade Associates projected future traffic volumes using a 1% per year background growth rate to account for possible growth within the area of the site;

- Gorove/Slade Associates generated site traffic volumes based on existing traffic counts and projected up to account for growth at the Center;
- Gorove/Slade Associates performed intersection capacity analyses for existing and total future (2006) peak hour traffic conditions at the intersections contained within the study area; and
- Gorove/Slade Associates conducted a parking occupancy survey on site to determine the existing and future parking needs

Sources of data for this study include Fairfax County, the Virginia Department of Transportation, studies performed by Wells & Associates, and the office files and field reconnaissance efforts of Gorove/Slade Associates, Inc.



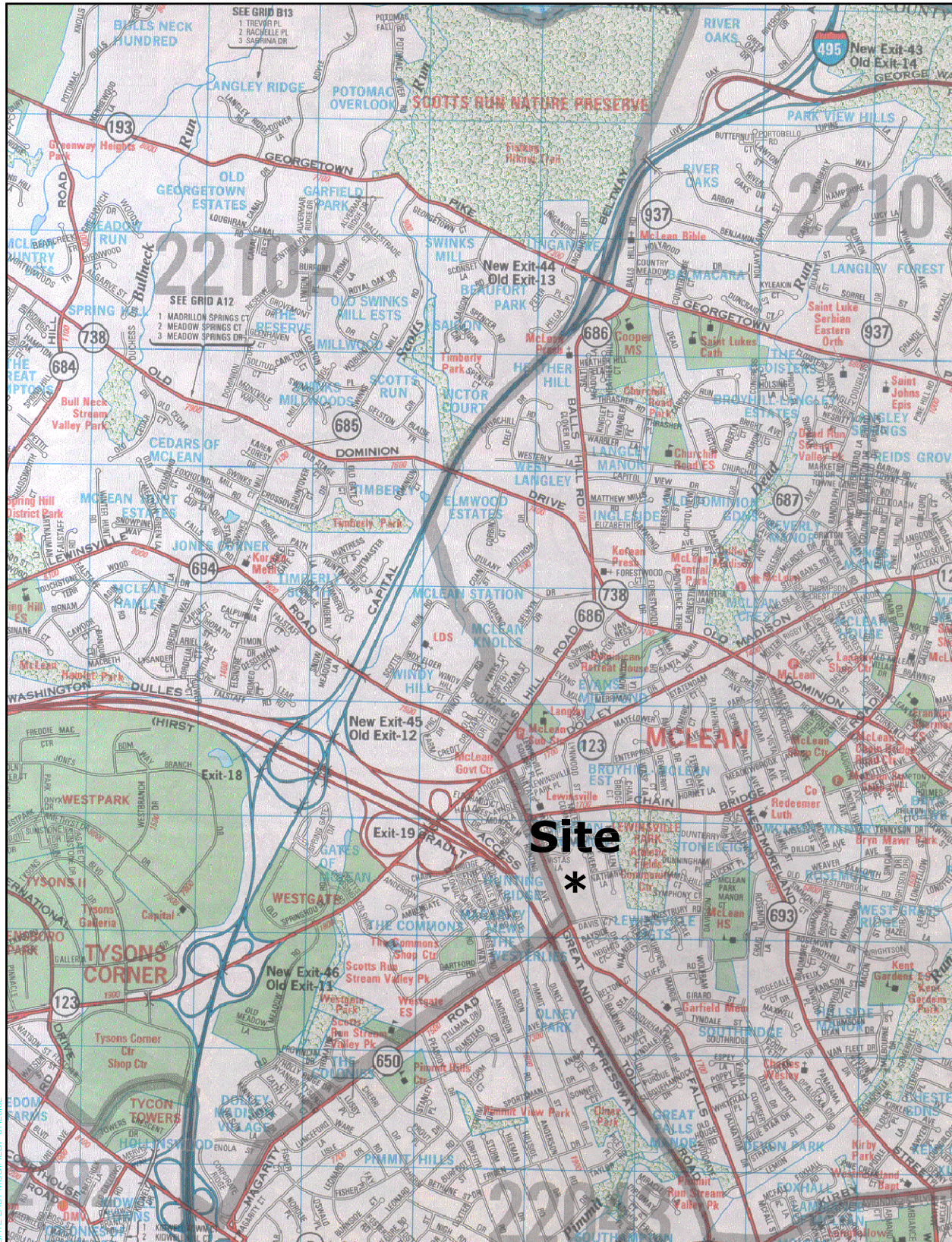


Figure 1  
Area Map and Site Location





## **A. Scope of Study**

The following intersections were identified in the July 24, 2002 scoping meeting with the design team for inclusion in this traffic study:

1. Chain Bridge Road with Great Falls Street (AM, PM, Sat)
2. Magarity Road/Davis Court with Great Falls Street (AM, PM, Sat)
3. Lewinsville Center North Site Driveway with Great Falls Street (AM, PM, Sat)
4. Lewinsville Center South Site Driveway with Great Falls Street (AM, PM, Sat)

In addition to the intersection turning movement counts conducted during the week of July 15, 2002, a parking and pick-up/drop-off assessment was conducted to determine the parking utilization on site and the amount of time spent when parents were picking up and dropping off children at the day care center.

## **B. Report Outline**

This report presents the findings of analyses performed for the following conditions:

- ***Existing Conditions***
  - A. Existing facility Use;
  - B. Existing Site Access and On-Site Circulation;
  - C. Existing On-Site Parking Occupancy;
  - D. Existing Roadway Network;
  - E. Existing Traffic Volumes;
  - F. Study Times; and
  - G. Existing Capacity Analysis
- ***Future Development Conditions (Year 2006)***
  - A. Total Future Conditions 2006 facility Use;
  - B. Total Future Conditions 2006 Traffic Generation;
  - C. Total Future Conditions 2006 Site Access and On-Site Circulation;
  - D. Total Future Conditions 2006 Distribution of Trip Generation;
  - E. Total Future Conditions 2006 On-Site Parking Occupancy;
  - F. Total Future Conditions 2006 Traffic Volumes; and
  - G. Total Future Conditions 2006 Capacity Analysis
  - H. Total Future Conditions 2006 Southern Site Drive Alternative Capacity Analysis

The results of the analysis and the traffic impacts associated with the proposed development plan are presented in the Conclusion section of this report.

### III. EXISTING CONDITIONS

#### A. Existing Facilities

The existing facility consists of a mix of community uses including two child day care centers, an adult day care center, a senior recreation center, and an adult independent living area. The existing facility uses are presented in Table 1 below:

**Table 1**  
**Existing Facility Use**

Use	Faculty/Staff & Volunteers	Students/Senior
Westgate Children's Center	23	90
Fun & Friends Child Development Centers, Inc.	27	97
Senior Center	9	70
Adult Day Care Center	9	45
Independent Living	9	22
<b>TOTAL</b>	<b>77</b>	<b>324</b>

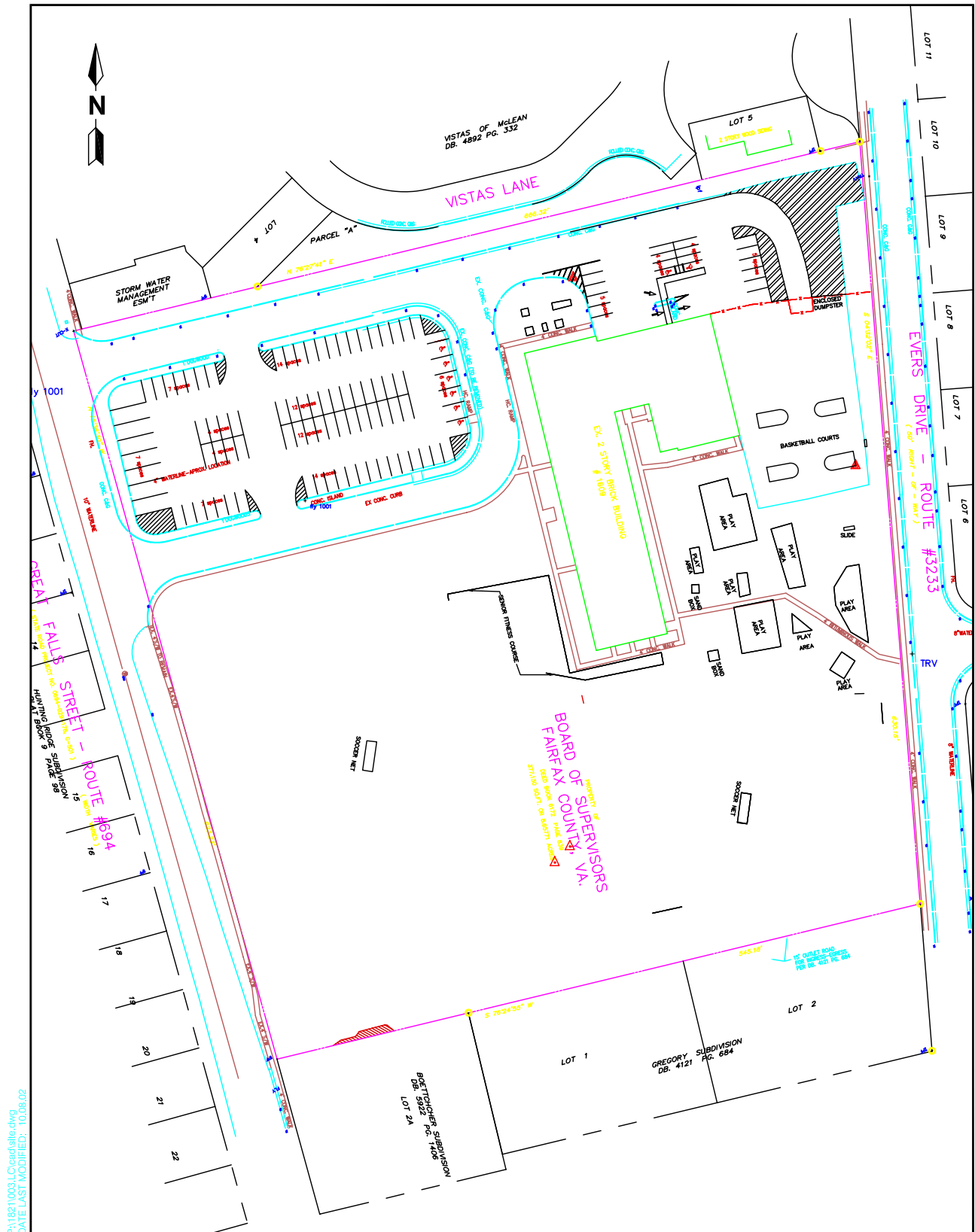
#### B. Existing Site Access and On-Site Circulation

The existing site access to the Lewinsville Center is provided by two driveways located along Great Falls Street. The southern driveway operates as a one-way inbound with access to the primary parking lot approximately 120 feet from Great Falls Street. Approximately 80 percent of the parking is located within this parking lot. Drivers dropping children off at the day care center will typically stop the vehicles at the front door to the site, walk the children into the day care facility, and then exit from the northern driveway. The average morning drop-off time for a parent is approximately 3.5 minutes and the average afternoon pick-up dwell time is approximately 4.5 minutes. Of note, when parents know that they will be taking longer than the average dwell time to drop off their child, the parents would generally park their vehicle in the parking lot and walk their child into the day care center. Parents would take approximately 11 minutes when parking the car in the parking lot vs. stopping at the front door to drop off/pick up their child.

The northern driveway operates as inbound and outbound access but primarily serves outbound traffic from the child day care center. The northern driveway also accommodates the inbound and outbound traffic for a large portion of the adult section of the facilities. Adults visiting the facilities are picked up and dropped off at both the front door to the facility as well as the side of the facility. The existing facilities layout is shown on Figure 2

#### C. Existing On-Site Parking

The existing 98-space surface parking lot consists of 9 handicap spaces, 7 bus spaces, and 82 common area parking spaces. Approximately 80 percent of the parking is situated within the parking lot located in the front of the site along Great Falls Road between the northern driveway and the southern driveway.



**Figure 2**  
Existing (2002) Site Configuration





A parking occupancy survey was conducted on September 18, 2002 between 11:00 a.m. and 2:00 p.m. to determine what the peak occupancy is at the Center. Based on the survey of the parking lot, it was observed that 59 cars and 2 buses were parking in the parking lot. Based on existing counts at the Lewinsville Center parking lot, we were able to account for peak demand at the Center. As shown in table 2 below, a sample time of demand at the Center's parking lot for the weekday is approximately 58%.

**Table 2**  
**Existing Parking Occupancy**

Parking Level	Supply	Parked Vehicles Wednesday (11:00 am - 2:00 pm)	Percent Occupied
11:00 a.m. 11:15 a.m.	98	55 (2 buses)	56%
11:15 a.m. 11:30 a.m.	98	56 (2 buses)	57%
11:30 a.m. 11:45 a.m.	98	54 (2 buses)	55%
11:45 a.m. 12:00 p.m.	98	57 (2 buses)	58%
12:00 p.m. 12:15 p.m.	98	56 (2 buses)	57%
12:15 p.m. 12:30 p.m.	98	59 (2 buses)	60%
12:30 p.m. 12:45 p.m.	98	61 (2 buses)	62%
12:45 p.m. 1:00 p.m.	98	57 (2 buses)	60%
1:00 p.m. 1:15 p.m.	98	57 (2 buses)	60%
1:15 p.m. 1:30 p.m.	98	53 (2 buses)	56%
1:30 p.m. 1:45 p.m.	98	54 (2 buses)	57%
1:45 p.m. 2:00 p.m.	98	59	60%
<b>Total / Average</b>	<b>98</b>	<b>57</b>	<b>58%</b>

#### **D. Existing Roadway Network**

##### ***Great Falls Street***

Great Falls Street is a two-lane undivided north-south arterial that is currently constructed from Dolley Madison Road in the north to Washington Street in the south. There is a right turn bay currently constructed into the northern driveway with left turn and right turn bays striped out all along Great Falls Street within the vicinity of the site. The posted speed limit in the vicinity of the site is 30 mph.

##### ***Chain Bridge Road***

Chain Bridge Road is a two-lane undivided east-west arterial that is currently constructed from Dolley Madison Road in the east to Great Falls Street in the west. The posted speed limit in the vicinity of the site is 30 mph.

### ***Magarity Road/Davis Court***

Magarity Road/Davis Court is a two-lane undivided east-west roadway that is currently constructed from Great Falls Street in the east to Leesburg Pike in the west. The posted speed limit in the vicinity of the site is 30 mph.

### **E. Study Times**

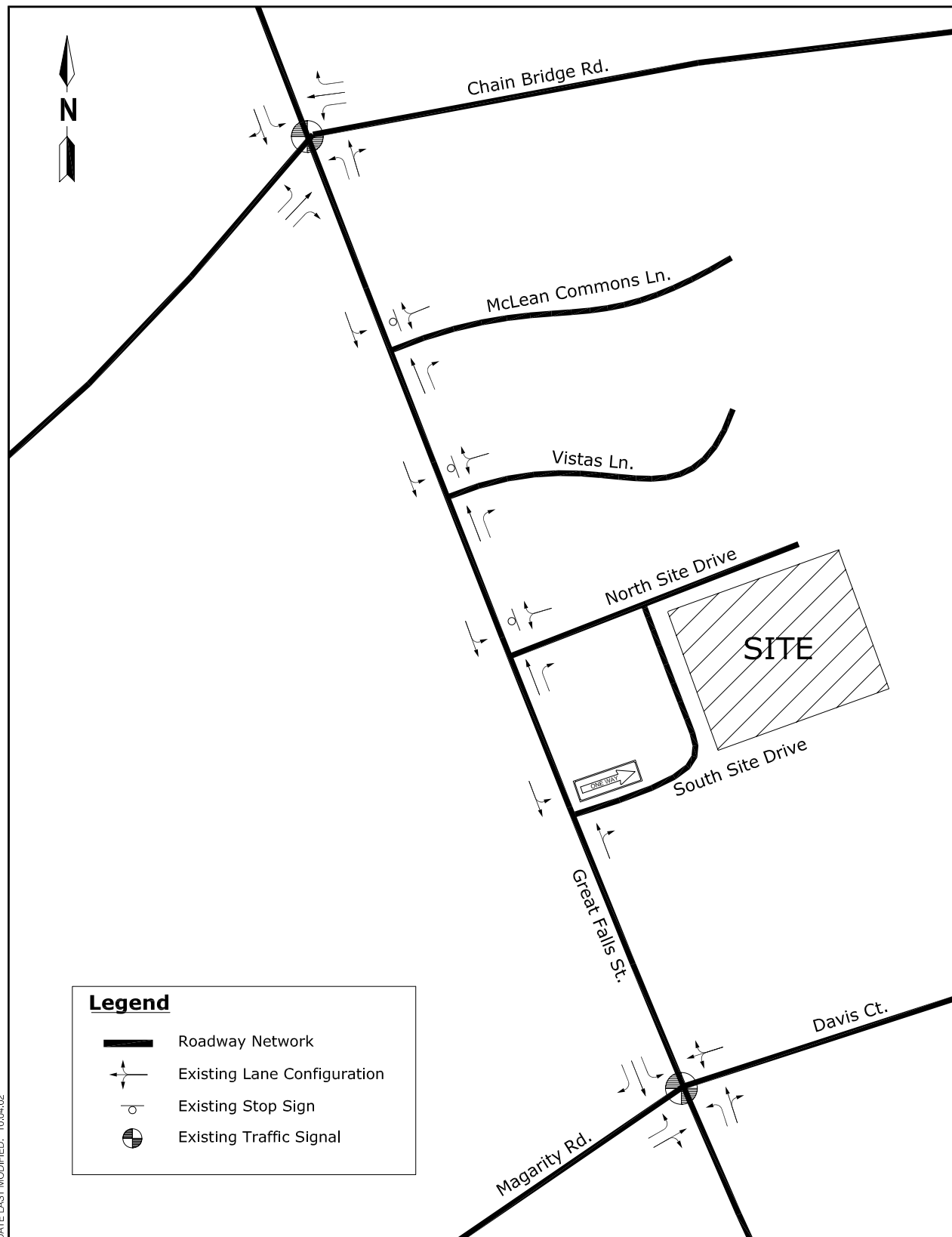
The existing weekday and weekend peak hour roadway traffic volumes were counted along Great Falls Street within the vicinity of the site. The two major peak times were determined to be the Weekday AM peak hour and PM Peak hour. See table 3 below for the peak hour roadway volumes within the vicinity of the proposed site. Therefore, the AM & PM peak hours were studied as the critical times for the intersections within the vicinity of the site.

**Table 3**  
**Existing Great Falls Street Peak Traffic Volumes**

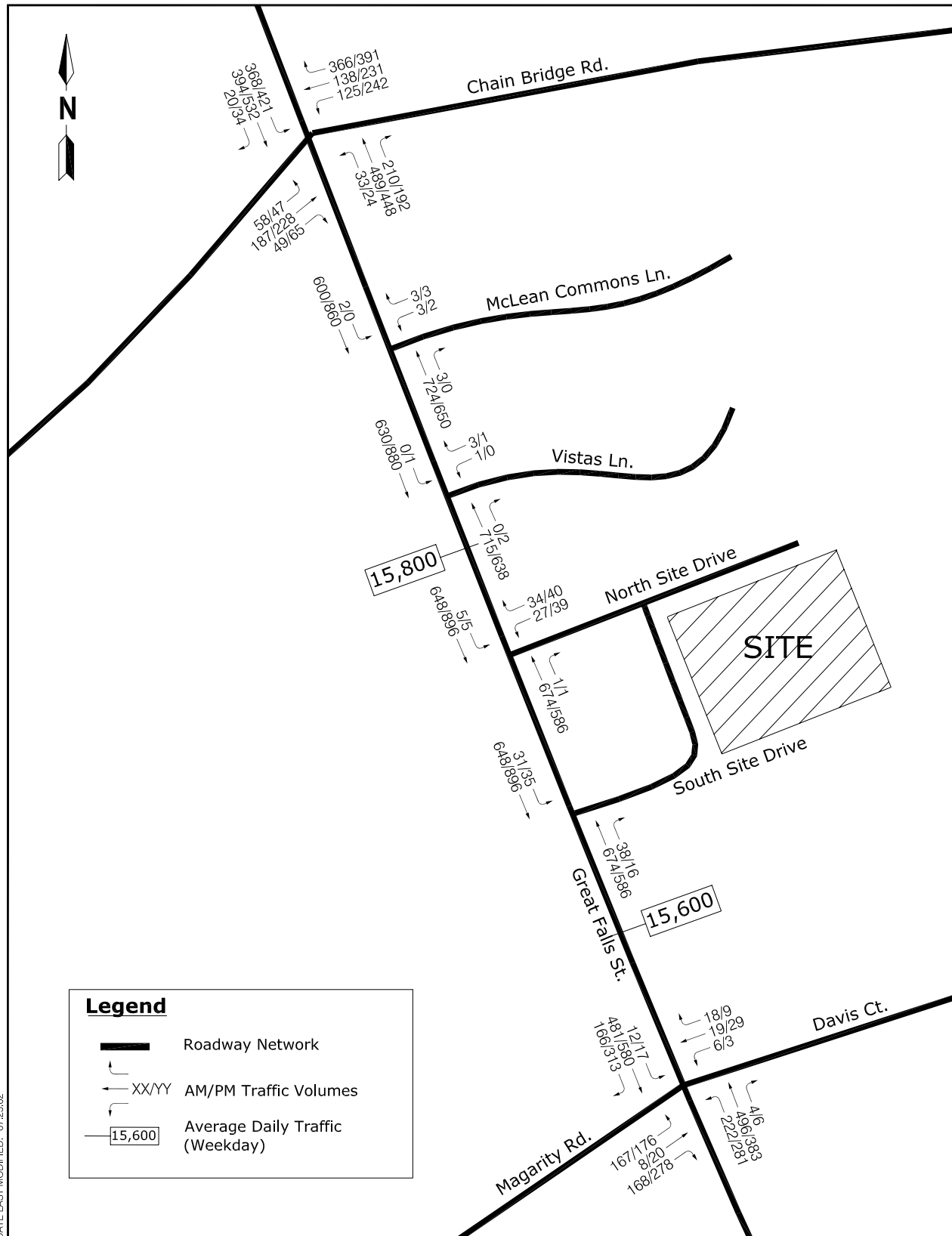
Weekday Peak Link Volumes		Weekend Peak Link Volumes
AM Peak Hour	PM Peak Hour	Saturday Peak Hour
690	<b>760</b>	448

### **F. Existing Traffic Volumes**

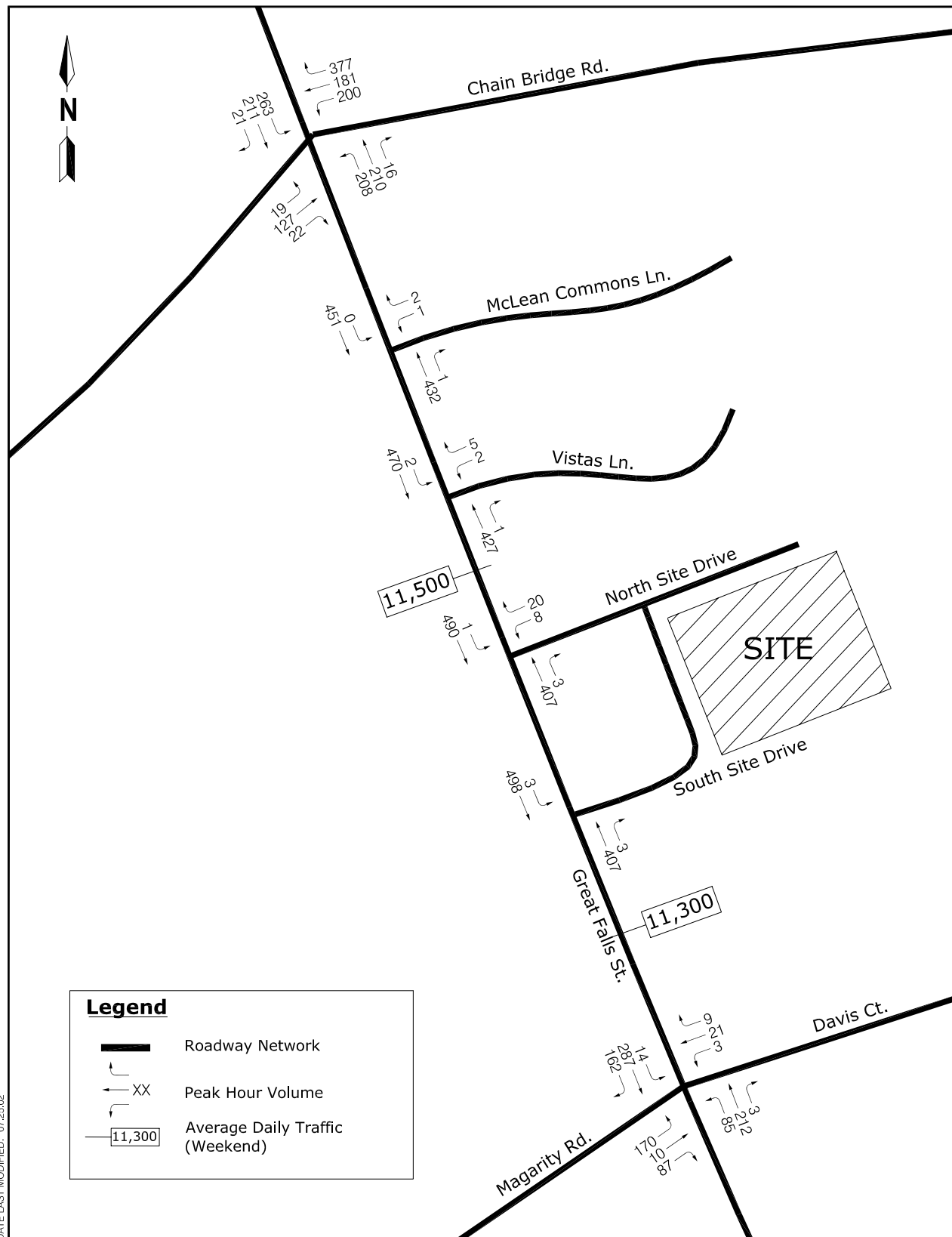
In order to determine the peak hour turning movement traffic volumes, traffic counts were performed on Tuesday, July 16, 2002 from 6:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 7:00 p.m. and on Saturday, July 20, 2002 from 10:00 a.m. to 2:00 p.m. The existing traffic volumes for the intersections contained within the study area are shown in Figures 3 and 4. Analysis of the existing traffic data determined that the weekday AM peak hour is from 7:45 a.m. to 8:45 a.m., the PM Peak hour is from 5:30 p.m. to 6:30 p.m., and the Saturday peak hour is from 10:00 a.m. to 11:00 a.m.



**Figure 3**  
Existing (2002) Local Roadway Network



**Figure 4**  
Existing (2002) Weekday AM/PM Peak Hour Traffic Volumes





## **G. Existing Conditions Capacity Analysis**

Capacity analyses were performed for the existing morning and evening peak hours for the intersection within the study area using the Highway Capacity Software 4.1b (HCM-2000). The delay terminology is attached below. Table 4 gives the existing levels of service for the intersections by approach, where applicable, and Figure 5 illustrates the capacity analysis results graphically. The detailed analysis worksheets are contained in the Technical Appendix.

All capacity analyses are based on the methods outlined by the Transportation Research Board's *Special Report 209: Highway Capacity Manual (HCM)*, 2000. Levels of service range from "A" (best) to "F" (worst), with LOS "D" or better considered to be within the acceptable county limits. A brief description of each level of service for signalized and unsignalized intersections is provided as follows:

} **Signalized Intersections:** Level of service is based upon the traffic volume present at the intersection, the capacity of each lane at the intersection and the resultant delay associated with each directional movement. The average intersection delay is calculated from the weighted average of the delay for each movement. The levels of service for individual movements as well as the overall signalized intersections are defined by average delay as described below:

Level of Service A describes operations with very low average delay per vehicle, i.e., less than 10.0 seconds. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop. Short signal cycle lengths may also contribute to low delay.

Level of Service B describes operations with average delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS "A", causing higher levels of average delay.

Level of Service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level although many still pass through the intersection without stopping. This is generally considered the lower end of the range of the acceptable level of service in rural areas.

Level of Service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and/or high traffic volumes as compared to the roadway capacity. Many vehicles are required to stop and the number of vehicles that do not have to stop declines. Individual signal cycle failures, where all waiting vehicles do not clear the intersection during a single green time, are noticeable. This is generally considered the lower end of the range of the acceptable level of service in urban areas.

Level of Service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. These higher delay values generally indicate poor progression, long cycle lengths, and high traffic volumes. Individual cycle failures are frequent occurrences.

Level of Service F describes operations with average delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when traffic arrives at a flow rate that exceeds the capacity of the intersection. It may also occur at high volumes with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such delays.

} **Unsignalized Intersections:** At an unsignalized intersection, the major streets through traffic and right turns are assumed to operate unimpeded and therefore receive no level of service rating. The level of service for the minor street and the major street left turn traffic is dependent on the volume and capacity of the available lanes, and, the number and frequency of acceptable gaps in the major street traffic to make a conflicting turn. The level of service grade is provided for each conflicting movement at an unsignalized intersection and is based on the total average delay experienced by each vehicle. The delay includes the time it takes a vehicle to move from the back of a queue through the intersection.

} The unsignalized intersection level of service analysis does not account for variations in driver behavior or the effects of nearby traffic signals. Therefore, the results from this analysis usually indicate worse levels of service than may be experienced in the field. The unsignalized intersection level of service descriptions are provided below:

v Level of Service A: Describes operations where there is very little to no conflicting traffic for a minor side street movement, i.e., an average total delay of less than 10.0 seconds per vehicle.

v Level of Service B: Describes operations with average total delay in the range of 10.1 to 15.0 seconds per vehicle.

v Level of Service C: Describes operations with average total delay in the range of 15.1 to 25.0 second per vehicle.

v Level of Service D: Describes operations with average total delay in the range of 25.1 to 35.0 seconds per vehicle.

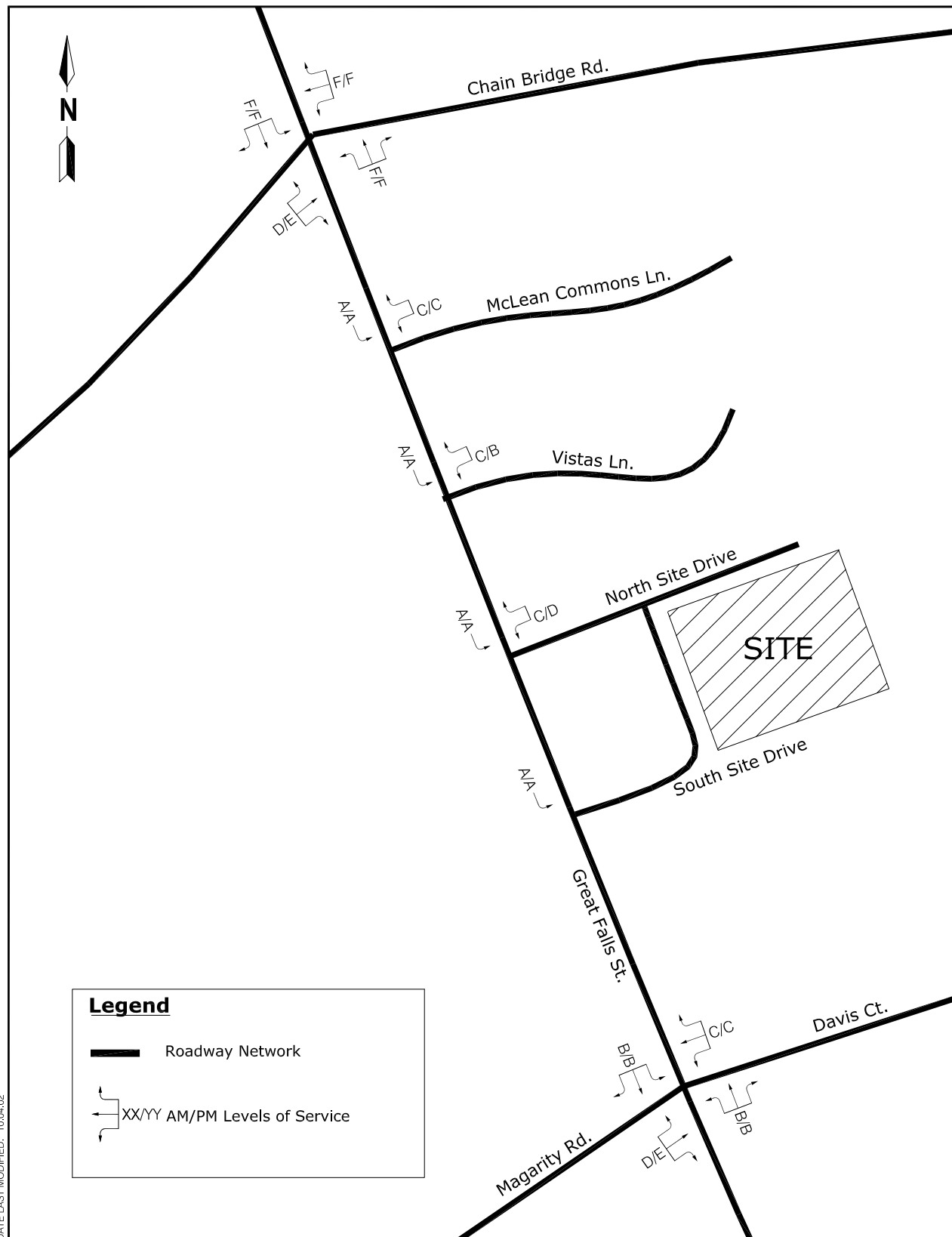
v Level of Service E: Describes operations with average total delay in the range of 35.1 to 50.0 seconds per vehicle.

v Level of Service F: Describes operations with average total delay of 50 seconds per vehicle. LOS "F" exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through or enter a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queuing on the minor approaches. It is important to note that LOS "F" may not always result in long queues or delays but may result in adjustments to normal driver behavior.

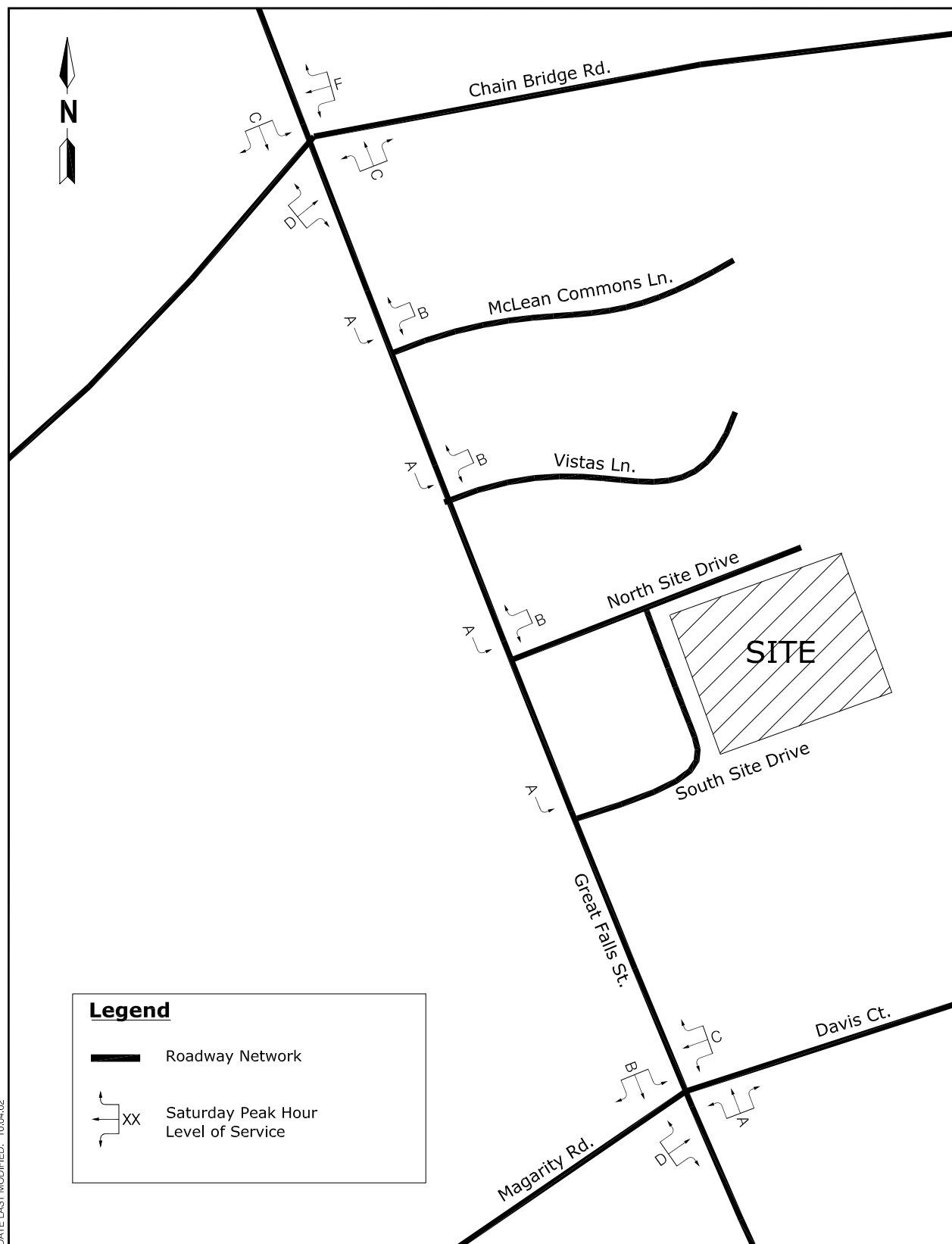
**Table 4**  
**Existing Intersection Capacity Analysis**

Roadway Intersection	Level of Service (Delay in Seconds)		
	AM Peak Hour	PM Peak Hour	SATURDAY Peak Hour
<b>Great Falls Street (Route 694) with Chain Bridge Road</b> <i>(Signalized)</i>			
Intersection	F (124.3)	F (124.3)	E (71.0)
Eastbound Approach	D (53.8)	E (62.4)	D (50.3)
Westbound Approach	F (131.8)	F (136.3)	F (129.1)
Northbound Approach	F (177.1)	F (136.0)	C (29.6)
Southbound Approach	F (95.3)	F (127.1)	C (25.4)
<b>Great Falls Street (Route 694) with Mclean Commons Road</b> <i>(Unsignalized)</i>			
Westbound Approach	C (19.9)	C (20.7)	B (12.6)
Southbound Left Turn	A (9.1)	A (8.8)	A (8.2)
<b>Great Falls Street (Route 694) with Vistas Lane</b> <i>(Unsignalized)</i>			
Westbound Approach	C (16.7)	B (12.5)	B (12.5)
Southbound Left Turn	A (9.0)	A (8.8)	A (8.2)
<b>Great Falls Street (Route 694) with North Site Drive</b> <i>(Unsignalized)</i>			
Westbound Approach	C (22.8)	D (31.0)	B (12.7)
Southbound Left Turn	A (8.9)	A (8.6)	A (8.1)
<b>Great Falls Street (Route 694) with South Site Drive</b> <i>(Unsignalized)</i>			
Southbound Left Turn	A (9.2)	A (8.8)	A (8.1)
<b>Great Falls Street (Route 694) with Magarity Road/Davis Court</b> <i>(Signalized)</i>			
Intersection	B (17.1)	C (27.0)	B (17.4)
Eastbound Approach	D (37.7)	E (71.3)	D (36.7)
Westbound Approach	C (29.8)	C (29.9)	C (29.5)
Northbound Approach	B (10.5)	B (12.8)	A (8.6)
Southbound Approach	B (12.7)	B (14.1)	B (11.1)

Table 4 shows that the signalized intersections of Great Falls Street with Chain Bridge Road and Great Falls Street with Magarity Road/Davis Court will require improvements to meet the desired criteria of a level of service "D" or better under the existing condition with no new site development. All suggested roadway improvements are required to accommodate existing traffic.



**Figure 6**  
Existing (2002) Weekday AM/PM Peak Hour Levels of Service  
(No new site development)



**Figure 7**  
Existing (2002) Saturday Peak Hour Levels of Service  
(No new site development)



#### IV. TOTAL FUTURE DEVELOPMENT CONDITIONS (2006)

##### A. Revised Development Facility

The proposed revised development of the Lewinsville Center located along the east side of Great Falls Street is to update the overall look and operations of the site. In addition to the Center's make over, Fairfax County Department of Housing and Community Development is planning to add sixty (60) assisted living areas and an Alzheimer Family Care Center. Table 5 below shows the increase in use at the center from existing to proposed.

**Table 5**  
**Revised Facility Use**

Use	Faculty/Staff & Volunteers		Students/Senior	
	Existing	Proposed	Existing	Proposed
Westgate Children's Center	23	23	90	90
Fun & Friends Child Development Centers, Inc.	27	29	97	105
Senior Center	9	9	70	70
Adult Day Care Center	9	9	45	45
Alzheimer's Family Day Care Center	0	27	0	16
Independent Living	9	9	22	22
Assisted Living	0	23	0	60
<b>TOTAL</b>	<b>77</b>	<b>129</b>	<b>324</b>	<b>408</b>

##### B. Revised Development Traffic Generation

Traffic volumes for the proposed revised development were generated for the AM and PM peak hour. The existing trips into and out of the site were used and then increased to account for any growth at the Center. The results of the calculations are presented in Table 6.

**Table 6**  
**Trip Generation Calculations (2006)**

Land Use	Size		----- Week day -----					
			A.M. Peak Hour			P.M. Peak Hour		
			TOTAL	In	Out	TOTAL	In	Out
<b>CHILD DAY CARE CENTER</b>	Staff	Students						
Westgate Children's Center	23	90						
Fun & Friend Child Development Centers, Inc.	27	105						
Existing Conditions	50	187	128	67	61	113	51	62
Proposed Future Conditions	52	195	132	69	63	117	52	65
<b>Difference</b>			<b>4</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>3</b>
<b>Total Proposed Trips for Child Day Care</b>			<b>132</b>	<b>69</b>	<b>63</b>	<b>117</b>	<b>52</b>	<b>65</b>

**Table 6**  
**Trip Generation Calculations (2006) – Continued**

Land Use	Size		----- Week day -----					
			A.M. Peak Hour			P.M. Peak Hour		
			TOTAL	In	Out	TOTAL	In	Out
<b>SENIOR RECREATION CENTER</b>	Staff / Volunteers	Seniors						
Existing Conditions	9	70	4	3	1	9	3	6
Proposed Future Conditions	9	70	4	3	1	9	3	6
<b>Difference</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Proposed Trips for Recreation Center</b>			<b>4</b>	<b>3</b>	<b>1</b>	<b>9</b>	<b>3</b>	<b>6</b>
<b>ADULT DAY CARE CENTER</b>	Staff / Volunteers	Seniors						
Existing Conditions	9	45	4	3	1	10	3	7
Proposed Future Conditions	9	45	4	3	1	10	3	7
<b>Difference</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Proposed Trips for Recreation Center</b>			<b>4</b>	<b>3</b>	<b>1</b>	<b>10</b>	<b>3</b>	<b>7</b>
<b>ALZHEIMER'S FAMILY DAY CARE CENTER</b>	Staff / Volunteers	Seniors						
Existing Conditions	0	0	0	0	0	0	0	0
Proposed Future Conditions	27	16	3	2	1	6	2	4
<b>Difference</b>			<b>3</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>2</b>	<b>4</b>
<b>Total Proposed Trips for Recreation Center</b>			<b>3</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>2</b>	<b>4</b>
<b>INDEPENDENT LIVING</b>	Staff / Volunteers	Seniors						
Existing Conditions	9	22	3	2	1	5	1	4
Proposed Future Conditions	9	22	3	2	1	5	1	4
<b>Difference</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Proposed Trips for Recreation Center</b>			<b>3</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>4</b>
<b>ASSISTED LIVING</b>	Staff / Volunteers	Seniors						
Existing Conditions	0	0	0	0	0	0	0	0
Proposed Future Conditions	23	60	4	3	1	5	2	3
<b>Difference</b>			<b>4</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>3</b>
<b>Total Proposed Trips for Recreation Center</b>			<b>4</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>3</b>
<b>TOTAL EXISTING TRIPS</b>			<b>139</b>	<b>75</b>	<b>64</b>	<b>137</b>	<b>58</b>	<b>79</b>
<b>TOTAL PROPOSED TRIPS</b>			<b>150</b>	<b>82</b>	<b>68</b>	<b>152</b>	<b>63</b>	<b>89</b>
<b>TOTAL NEW SITE TRIPS</b>			<b>11</b>	<b>7</b>	<b>4</b>	<b>15</b>	<b>5</b>	<b>10</b>

### **C. Proposed Site Access**

The proposed revised development of the Lewinsville Center is bounded by Vistas Lane to the North, Davis Court to the South, Evers Drive to the East, and Great Falls Street to the West. Direct access to the site will be gained along Great Falls Street at both a north driveway and a south driveway. The Lewinsville Center is being planned to maintain the north driveway (inbound and outbound) and relocate the inbound south driveway to an inbound/outbound configuration approximately 145 feet to the south. The primary access to the site will be gained from the southern driveway due to its proximity to the day care center, the Center's primary vehicular user.

In addition, the relocation of the southern driveway from the existing location to the proposed access located approximately 145 feet south of the existing southern driveway will allow the Center to stripe in a left turn bay southbound for traffic accessing the site from the north. The new left turn bay will allow for uninterrupted traffic flow southbound along Great Falls Street. The traffic associated with the Lewinsville Center will maneuver into the southbound left turn bay thereby not stopping the flow of traffic southbound when attempting to make a left turn into the Lewinsville Center. Figure 8A depicts the proposed left and right turn bays along Great Falls Road at the Lewinsville Center. Also, a right turn bay may be constructed as part of the newly relocated south entrance to allow for uninterrupted traffic flow for the northbound approach to the site along Great Falls Street during the AM and PM peak hours.

In addition to the roadway improvements directly related to the Lewinsville Center development, other roadway modifications may be conducted within the vicinity of the development to improve the Great Falls Street corridor. Re-striping the northbound direction of Great Falls Street at Chain Bridge Road to include an additional northbound through lane within the existing roadway cross section will help achieve a level of service "D" or better under existing and future conditions. Figure 8B depicts the future lane geometry at the intersection of Great Falls Street with Chain Bridge Road.

### **D. Proposed Site Trip Distribution and Assignment**

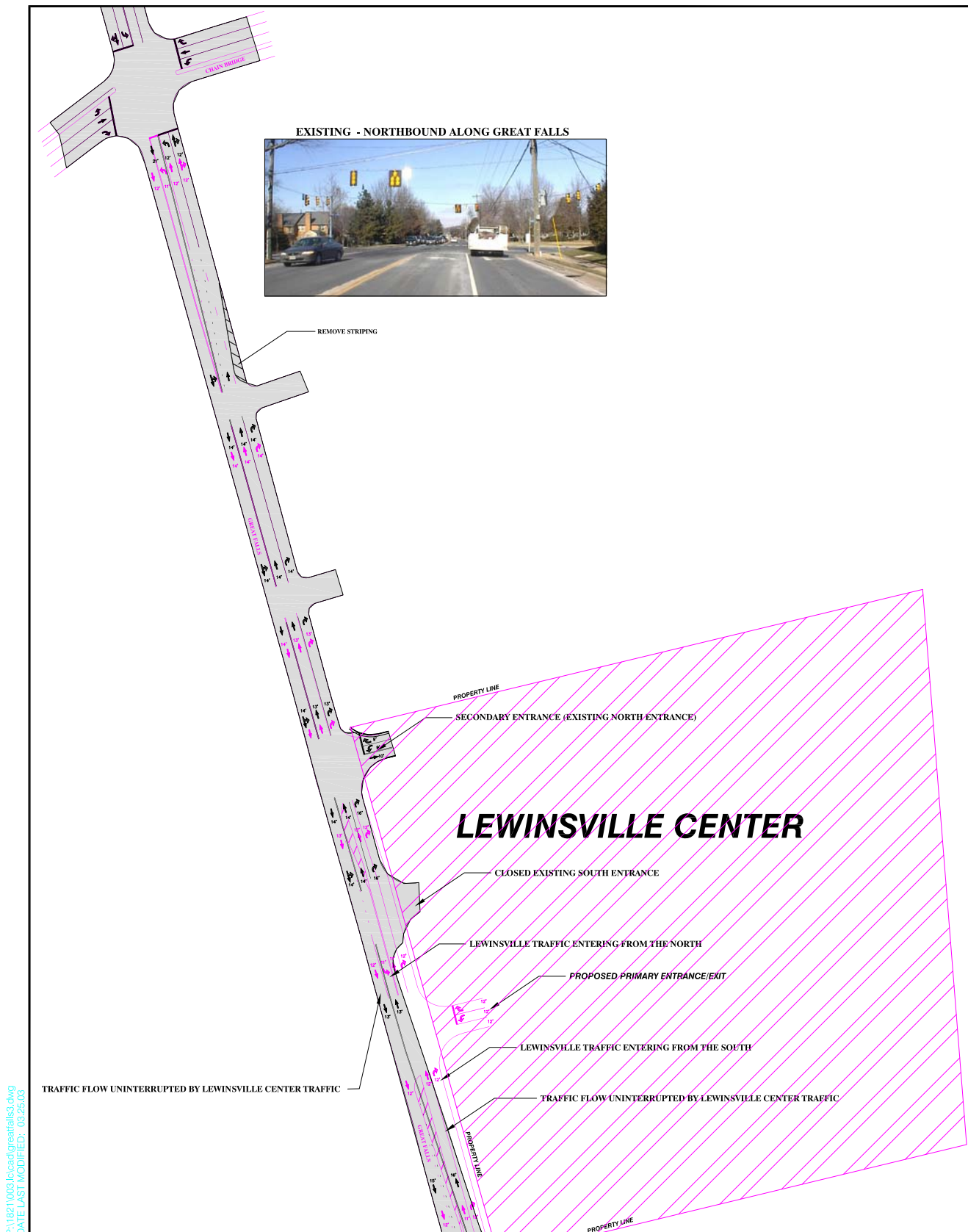
Approximately half of the site trips accessing the site today are generated from the north. The same is true for the return trips to and from the site. Based on the review of existing conditions and distributions of site traffic, trip assignments were determined for the site and are shown in Figure 9.

### **E. Proposed Development Parking Generation**

Approximately 65 additional parking spaces were added to the existing 98 surface parking spaces located at the Lewinsville Center. These spaces will be provided throughout the new layout of the Center to accommodate each individual use on site. The newly designed parking layout at the Lewinsville Center will accommodate easy access into and out of each of the buildings based on the close proximity of parking to each door front. The day care center will have parking centrally located near the new entrance to the site, as will the assisted living building and the recreation center. Each building will have parking located near the entrance to the building to accommodate each individual use.

#### **F. Total Future Development Traffic Volumes**

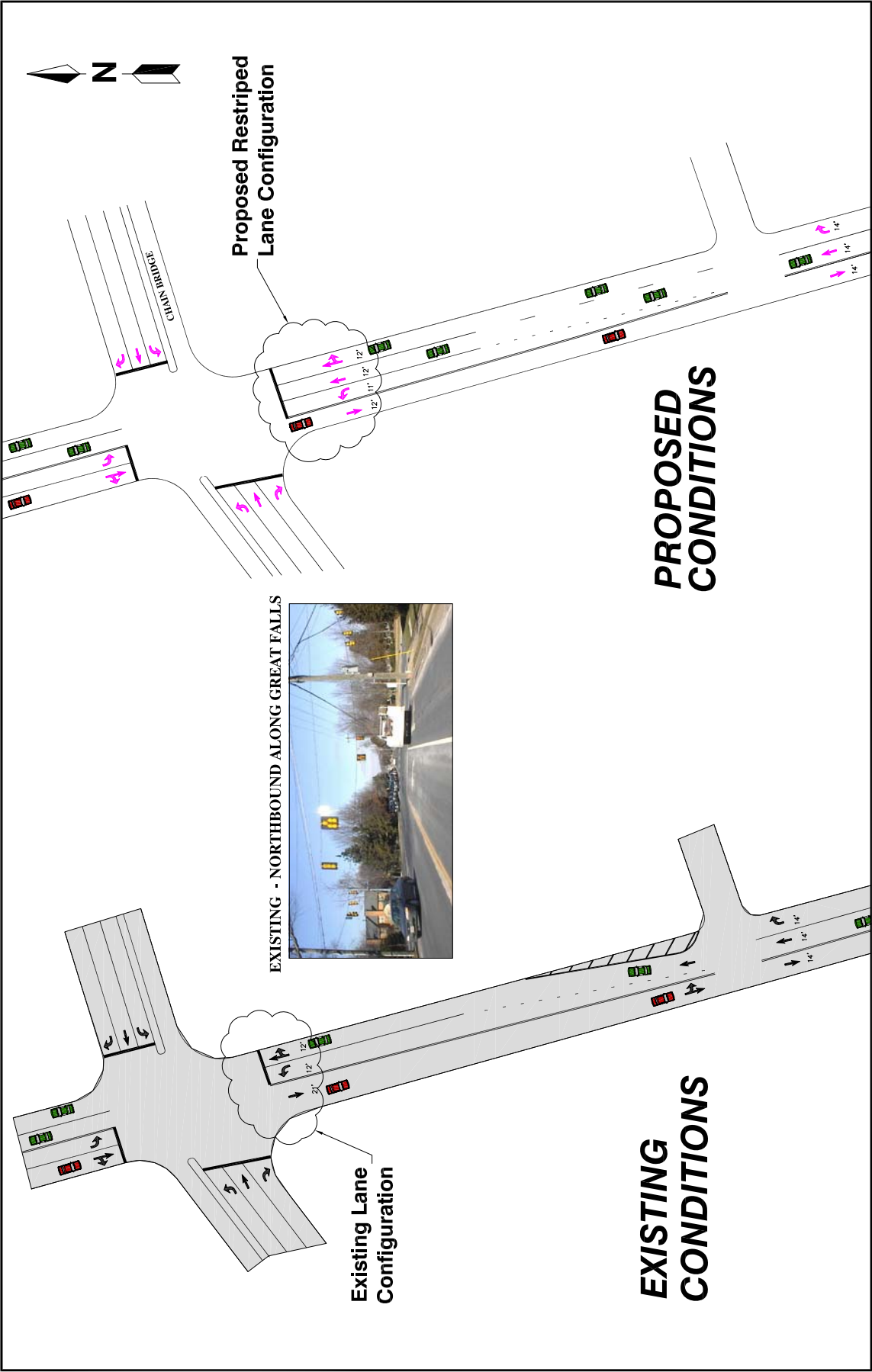
In order to determine the traffic volumes present on the roadways in the vicinity of the development site under the build 2006 condition, the proposed redevelopment traffic volumes were added to the existing volumes and the 1% annual inherent growth in traffic over the next three years (3.03% for three years). The traffic volumes for total future weekday conditions are shown in Figure 10.



**Figure 8A**  
Proposed Lane Configuration Along Great Falls Street

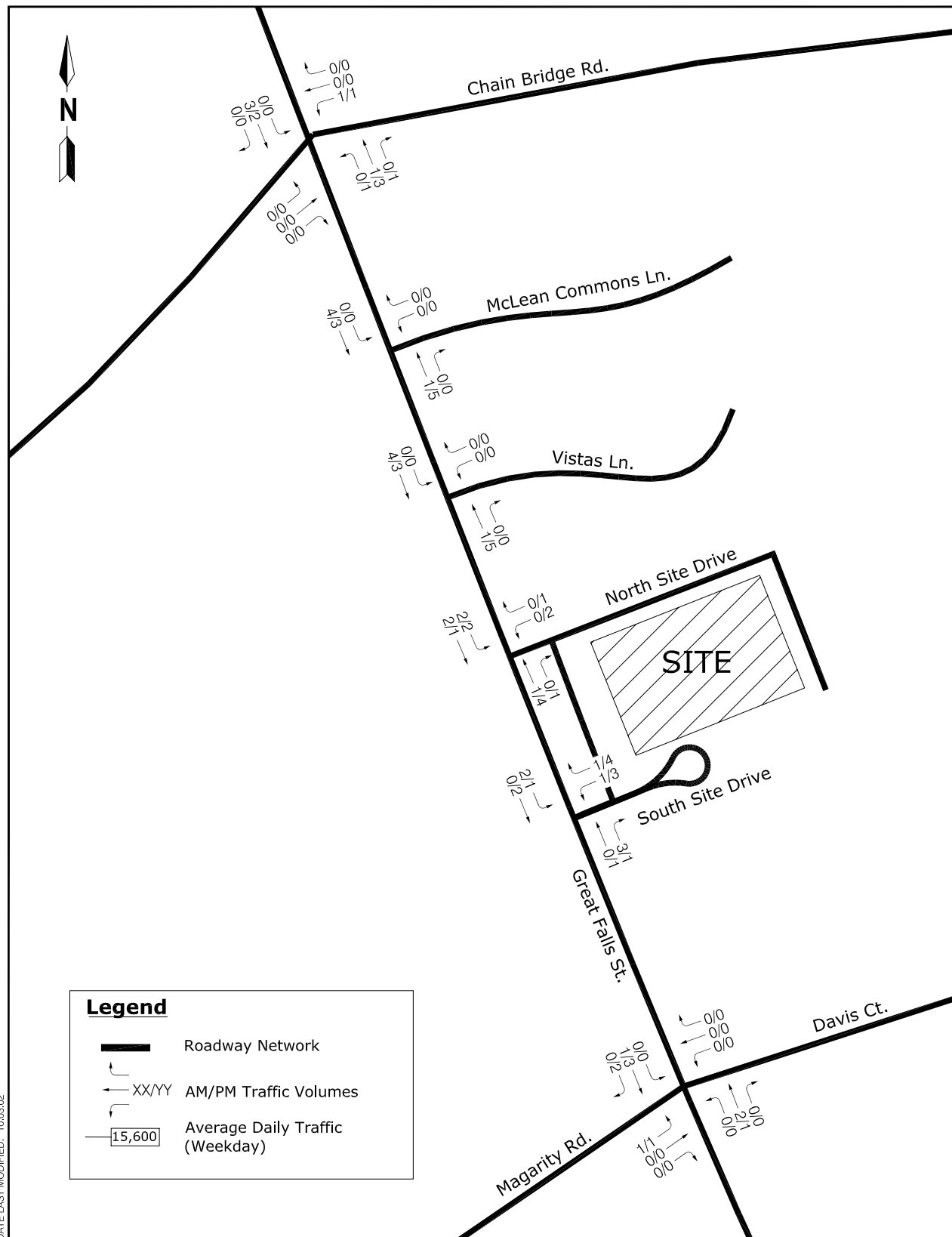
Scale: 1"=50'



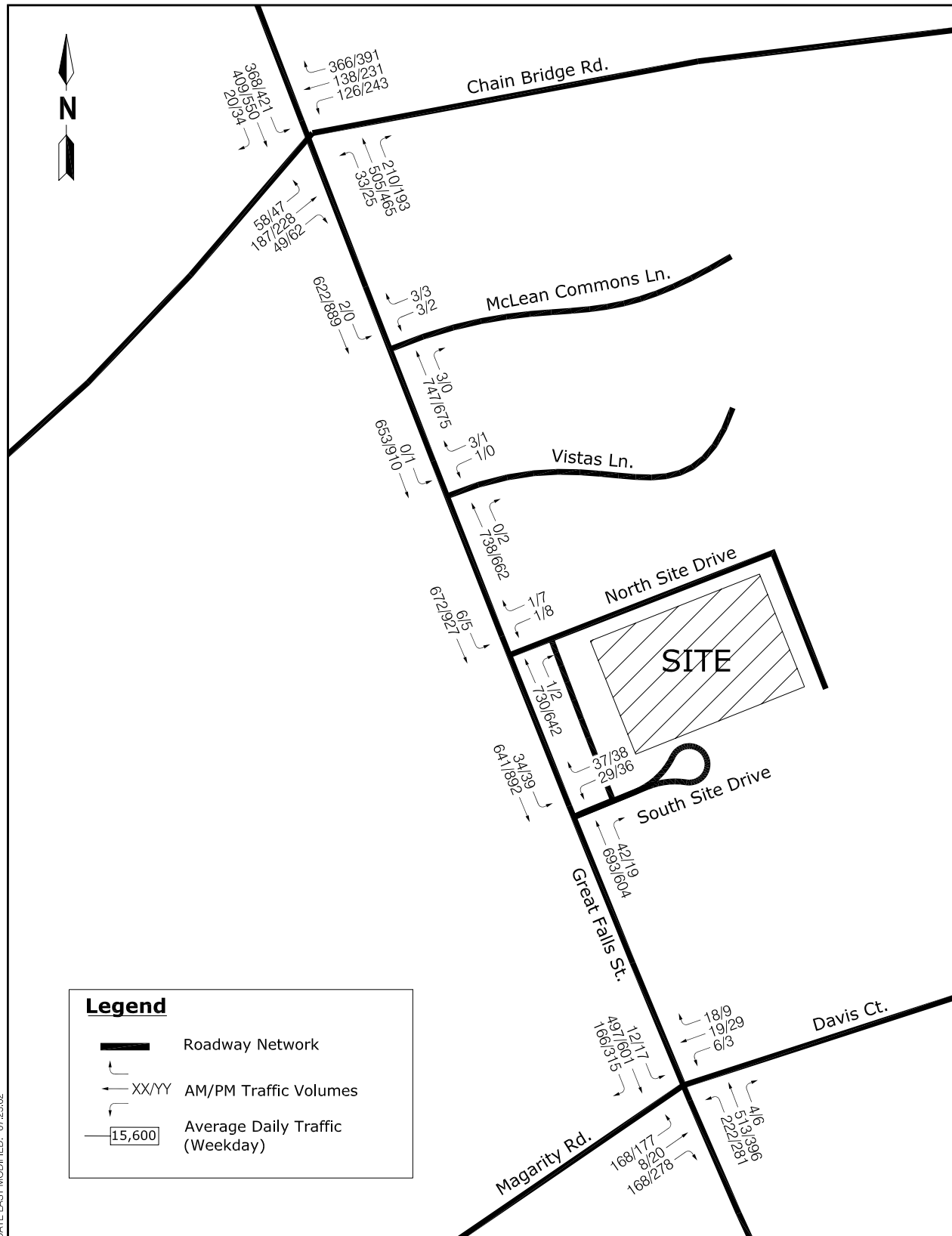


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**Figure 8B**  
Proposed Lane Configuration Along Great Falls Street  
Scale: 1" = 30'



**Figure 9**  
Total Future (2006) Site Volumes



**Figure 10**  
Total Future (2006) Peak Hour Traffic Volumes

## G. Total Future Development Capacity Analysis

Capacity analysis was performed for the total future conditions 2006. The results summarized are in Table 7 and give the levels of service by approach, where applicable. Figure 11 illustrates the capacity analysis results graphically. A detailed review of the HCS analysis is provided in the Technical Appendix.

**Table 7**  
**Total Future (2006) Intersection Capacity Analysis**

Roadway Intersection		Level of Service (Delay in Seconds)	
		AM Peak Hour	PM Peak Hour
<b>Great Falls Street (Route 694) with Chain Bridge Road</b> <i>(Signalized)</i>	<b>Intersection</b>	F (127.9)	F (127.4)
	<b>Eastbound Approach</b>	D (53.8)	E (62.4)
	<b>Westbound Approach</b>	F (131.7)	F (136.3)
	<b>Northbound Approach</b>	F (189.3)	F (148.0)
	<b>Southbound Approach</b>	F (94.5)	F (127.5)
	<b>Mitigation:</b>		
	1) Adjust Signal Timings, Phasing, and Cycle Length	C (32.8)	D (37.6)
	2) Add a Northbound Shared Through/Right Turn Lane	D (53.9)	D (48.4)
		D (47.4)	D (37.5)
		C (27.1)	D (43.2)
<b>Great Falls Street (Route 694) with Mclean Commons Road</b> <i>(Unsignalized)</i>	<b>Westbound Approach</b>	C (20.9)	C (21.7)
	<b>Southbound Left Turn</b>	A (9.2)	A (8.9)
<b>Great Falls Street (Route 694) with Vistas Lane</b> <i>(Unsignalized)</i>	<b>Westbound Approach</b>	C (17.3)	B (12.8)
	<b>Southbound Left Turn</b>	A (9.1)	A (8.9)
<b>Great Falls Street (Route 694) with North Site Drive</b> <i>(Unsignalized)</i>	<b>Westbound Approach</b>	C (21.2)	D (26.0)
	<b>Southbound Left Turn</b>	A (9.1)	A (8.8)
<b>Great Falls Street (Route 694) with South Site Drive</b> <i>(Unsignalized)</i> <i>Based on no Left-Turn or Right Turn Bays into the Site</i>	<b>Westbound Approach</b>	D (26.6)	D (30.6)
	<b>Southbound Left Turn</b>	A (9.3)	A (8.9)
<b>Great Falls Street (Route 694) with Magarity Road/Davis Court</b> <i>(Signalized)</i>	<b>Intersection</b>	B (17.2)	C (27.1)
	<b>Eastbound Approach</b>	D (27.8)	E (71.3)
	<b>Westbound Approach</b>	C (29.8)	C (29.9)
	<b>Northbound Approach</b>	B (10.7)	B (13.5)
	<b>Southbound Approach</b>	B (12.9)	B (14.5)
	<b>Mitigation:</b>		
	1) Adjust Signal Timings	B (17.2)	C (23.3)
		D (27.8)	D (40.9)
		C (29.8)	C (26.4)
		B (10.7)	B (18.4)
		B (12.9)	B (17.9)

Table 7 shows that the signalized intersections of Great Falls Street with Chain Bridge Road and Great Falls Street with Magarity Road/Davis Court will require improvements to meet the desired criteria of a level of service "D" or better under the existing condition and continue to need improvements under the total future conditions. The intersection of Great Falls Street with Chain Bridge Road will need adjustments to the signal timing, phasing, and cycle length as well as re-striping the northbound portion of the intersection to include an additional northbound through lane. The existing roadway cross section is wide enough to accommodate this modification to achieve a level of service "D" or better. Also, the intersection of Great Falls Street with Magarity Road/Davis Court will need adjustments to the signal timings to achieve a level of service "D" or better. All suggested roadway improvements are required to accommodate existing traffic conditions exclusive of any new development at the Lewinsville Center.

## **H. Total Future Southern Site Drive Alternative Capacity Analysis**

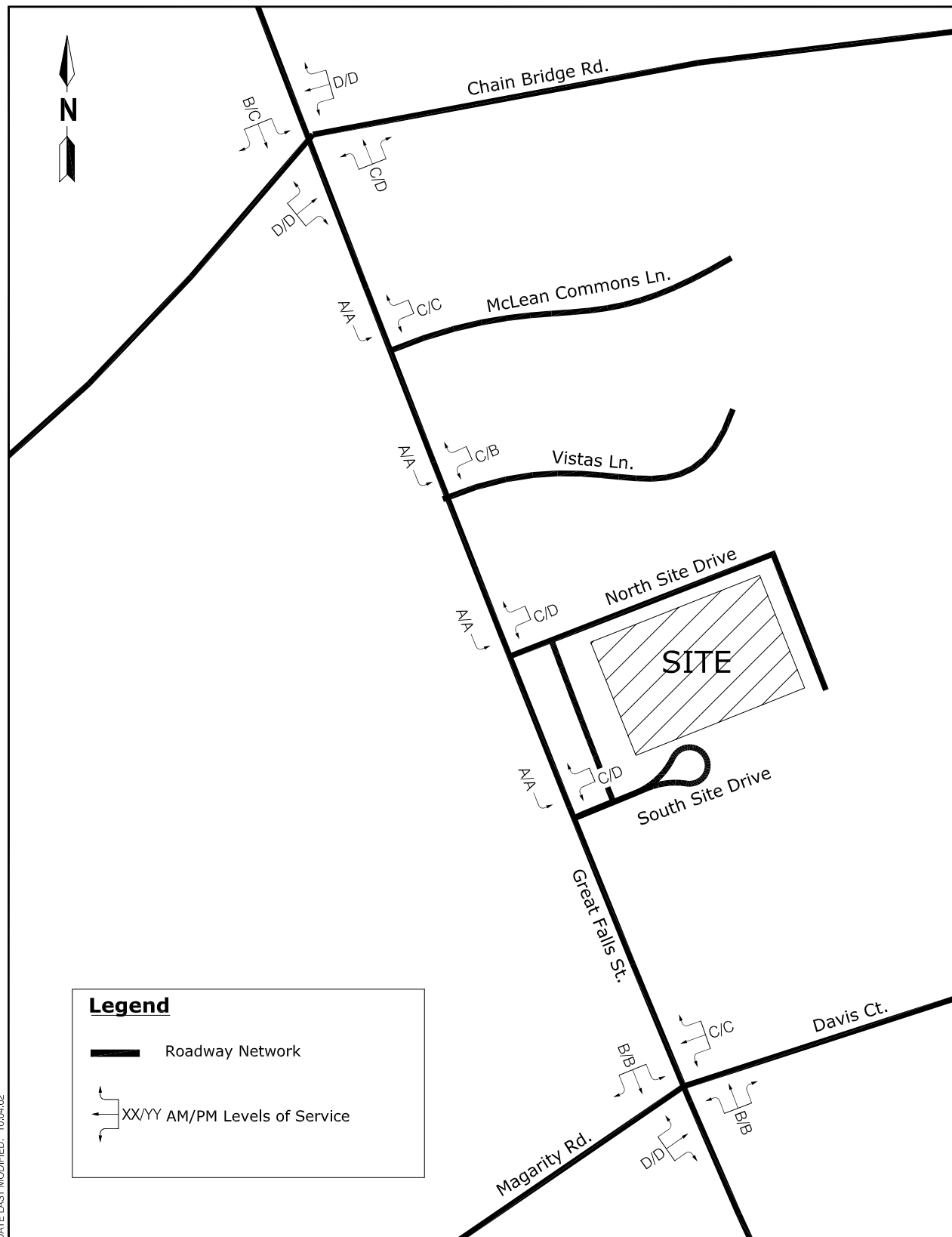
Capacity analysis was also performed for the total future conditions at the southern site driveway based upon four (4) alternatives. The site driveway was evaluated with a southbound left turn bay only, a northbound right turn bay only, southbound left and northbound right turn bays, and neither southbound left nor northbound right turn bays into the site along Great Falls Street. Of note, lane configuration exiting the site was determined to be two lanes (one left turn lane and one right turn lane) to accommodate the 50 percent split northbound and southbound along Great Falls Street. All alternatives noted above account for two westbound lanes on the approach to Great Falls Street. Each of the alternatives will show the levels of delay along Great Falls Street and the south site driveway. The results are summarized in Table 8 below:

**Table 8**  
**Total Future (2006) Southern Site Drive Alternative Capacity Analysis**

Roadway Intersection	Level of Service (Delay in Seconds)	
	AM Peak Hour	PM Peak Hour
<b>Great Falls Street (Route 694) with Lewinsville Center Proposed Southern Driveway</b> <i>Southbound Left Turn Bay Only</i>	<b>Westbound Approach</b>	D (30.6)
	<b>Southbound Left Turn</b>	A (8.9)
<b>Great Falls Street (Route 694) with Lewinsville Center Proposed Southern Driveway</b> <i>Northbound Right Turn Bay Only</i>	<b>Westbound Approach</b>	D (30.3)
	<b>Southbound Left Turn</b>	A (8.9)
<b>Great Falls Street (Route 694) with Lewinsville Center Proposed Southern Driveway</b> <i>Southbound Left Turn Bay and Northbound Right Turn Bay</i>	<b>Westbound Approach</b>	D (30.3)
	<b>Southbound Left Turn</b>	A (8.9)
<b>Great Falls Street (Route 694) with Lewinsville Center Proposed Southern Driveway</b> <i>No Southbound Left Turn Bay or Northbound Right Turn Bay</i>	<b>Westbound Approach</b>	D (30.6)
	<b>Southbound Left Turn</b>	A (8.9)

Table 8 shows that the southern site driveway along Great Falls Street will operate at acceptable levels of service under all four alternatives. It is recommended that a southbound left turn bay and northbound right turn bay be incorporated into the overall design in order to maintain uninterrupted traffic flow along Great Falls Street. Based on the analysis, the resulting total future roadway recommendations are shown on Figure 12.





**Figure 11**  
Total Future (2006) Peak Hour Levels of Service



**Figure 12**  
Recommended (2006) Lane Configuration and Traffic Control

## V. CONCLUSIONS

This report contains the findings of a traffic and parking impact study conducted for the Fairfax County Department of Housing and Community Development. Fairfax County Department of Housing and Community Development is proposing to revise the currently approved development plan of the existing Lewinsville Center located along the east side of Great Falls Street between the signalized intersections of Chain Bridge Road to the north and Magarity Road/Davis Court to the south. Currently, the Center has a mix of community uses including two child day care centers, an adult day care center, a senior recreation center, and an adult independent living area. Fairfax County Department of Housing and Community Development is planning to add sixty (60) assisted living areas and an Alzheimer Family Care Center.

The analysis presented in this report supports the following major conclusions:

### **Existing Conditions Exclusive of any New Site Development (2002)**

The following signalized intersections will require improvements to meet the criteria of a level of service "D" or better under the existing condition.

1. Great Falls Street with Chain Bridge Road
2. Great Falls Street with Magarity Road/Davis Court

The intersection of Great Falls Street with Chain Bridge Road will need adjustments to the signal timing, phasing, and Cycle as well as re-striping the northbound portion of the intersection to include an additional northbound through lane. The existing roadway cross section is wide enough to accommodate this modification to achieve a level of service "D" or better (*Level of Service definitions are depicted on pages 13 and 14 of the text*). In addition, the intersection of Great Falls Street with Magarity Road/Davis Court will need adjustments to the signal timings to achieve a level of service "D" or better. All suggested roadway improvements are required to accommodate existing traffic conditions exclusive of any new development at the Lewinsville Center.

### **Future Conditions with Proposed New Development (Total Future) 2006**

The following signalized intersections will require improvements to meet the criteria of a level of service "D" or better under the existing condition and continue to need improvements under the total future conditions.

1. Great Falls Street with Chain Bridge Road
2. Great Falls Street with Magarity Road/Davis Court

As stated under the existing conditions and exclusive of the Lewinsville Center, the intersection of Great Falls Street with Chain Bridge Road will need adjustments to the signal timing, phasing, and Cycle length as well as re-striping the northbound portion of the intersection to include an additional northbound through lane. The existing roadway cross section is wide enough to accommodate this modification to achieve a level of service "D" or better (*Level of Service definitions are depicted on pages 13 and 14 of the text*). In addition, the intersection of Great Falls Street with

Magarity Road/Davis Court will need adjustments to the signal timings to achieve a level of service "D" or better. All the suggested roadway improvements are required to accommodate existing traffic conditions exclusive of any new development at the Lewinsville Center. It is also recommended that a southbound left turn bay and northbound right turn bay be incorporated into the overall design of the Lewinsville Center in order to maintain uninterrupted traffic flow along Great Falls Street.